

Realistic Approaches to Rural and Frontier Hazardous Materials Risk Management

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1. Introduction

Hazardous materials risk management has evolved slowly, but the emphasis has always been on big industries with equally large resources. Planning and training efforts under SARA Title III (EPCRA) all the way up to the Clean Air Act Amendments are fixed-site

and industry-biased, with little concern for the small rural facility or the rural transportation incident. It was incumbent upon the rural and extremely rural (frontier) communities, therefore, to develop their own realistic approaches to hazardous materials risk management. The following concepts have evolved from the foundation of all rural and frontier response, the response communities themselves.

2. The Social Cost of Space

As Americans we honor space. Even those Americans who live in metropolitan, urban and suburban areas love to speak of the wide open spaces and annually vacation in America's hinterland to camp, fish, hunt and hike. Those of us who prefer to live where there is space, however, know that we must pay the price. Sociologists and anthropologists call this price the "social cost of space." This lets city folk know that it not only is different out there, out here, but that the difference is costly. This cost is measured in terms of services, accessibility, standard of living, social events and other necessities which metropolitan movers and shakers feel are quintessential to success.¹

The underpinnings of the social cost of space are manifest to anyone driving into a small town. It is evident that there is no industry base, no population base, no commerce base, no tax base, no governmental base, unless of course you're in the county seat, which is home base. Without an industry base, population base, commerce base and tax base, there can be nothing of the East Coast, West Coast, Gulf Coast standards of living. There are none of the services, none of the skilled technicians, none of the bureaucrats and little of the electronic and technological wizardry necessary to maintain "standards of care" that exist echelons above the reality of small town, frontier, extremely rural America.

Another cultural aspect of frontier America is the lack of everyday use of what might be called professional management techniques and terminology. Many of us in government, commerce and industry frequently talk win-win, TQM, MOB, MBA and vision statements, all the while discoursing at length ad nauseam on any of these topics. However, people working 60-80 hours a week on ranches, farms, in mining and logging ventures, or minding the store, have little time for abstract notions and bureaucratic jargon. It must be remembered that this paper discusses parts of America where a course could be marketed called "Management as a Second Language."

It should be noted here, that while sociologists and anthropologists might speak negatively, emphasizing the "social cost of space," this is almost purely an urban, university perspective. The inhabitants of the hinterland would speak of the "social cost of lack of space," and as negatives would list many of the assumed amenities of urban life, including management techniques and terminology.

3. Frontier Areas as a Governmental Concept

The U.S. Department of Health and Human Services (DHHS) and the U.S. Congress have taken the lead in developing the concept of "frontier" status and promoting the need for a separate but adequate standard of care for extremely rural areas.² Frontier is

extremely rural. Frontier has many close ties with rural and parallels rural to the extreme. Neither frontier or rural, while having much in common with each other, have many correlations with what the Census Bureau calls "urban" or which the Office of Management and Budget (OMB) calls "metropolitan." Urban and metropolitan areas, even towns of 50,000 or more, those are the areas targeted by federal agencies, due to their population bases, due to their statistically high per capita effect of federal dollars. To need to combat the historical federal urban bias is precisely the reason the frontier approach was developed at the national level. The urban bias is the reason why a frontier and rural hazardous materials risk management approach is critical. Therefore, while much emphasis will be placed herein on frontier or extremely rural areas, equal emphasis is due rural areas, or as OMB calls them, non-metropolitan areas.³

As was noted in an early document on the effect of extremely low population on emergency management⁴, Montana Disaster and Emergency Services has adopted the frontier designation as defined by the Department of Health and Human Services in an attempt to emphasize the extremely rural nature of most of its counties.⁵ To be eligible for DHHS Bureau of Health Care Delivery and Assistance support as a frontier area, the following service area criteria must be met:

Service Area: a rational area in the frontier will have at least 500 residents within a 25-mile radius of the health services delivery site or within the rationally established trade area. Most areas will have between 500 and 3,000 residents and cover large geographic areas.

Population Density: the service area will have six or fewer persons per square mile.

Distance: the service area will be such that the distance from a primary care delivery site within the service area to the next level of care will be more than 45 miles and/or the average travel time more than 60 minutes. When defining the "next level of care," we are referring to a facility with a 24-hour emergency care, with 24-hour capability to handle an emergency caesarean section or a patient having a heart attack and some specialty mix to include at a minimum, obstetric, pediatric, internal medicine and anesthesia services.⁶

4. How much of the United States is frontier and rural?

How much of the United States is frontier? A look at the map delineating frontier areas by county, shows that about one third of the geographic area of the U.S. has been categorized as frontier.⁷ How much is rural? A look at maps delineating urban and metropolitan areas, and subtracting areas designated in the previous map as frontier, it becomes obvious, using the definition of rural as non-urban and non-metropolitan, that well over another third of the U.S. is rural.⁸ Thus, the combination of frontier (one-third) and rural (over one-third) equals approximately three-fourths of the geographic area of the United States. An area well worth the immediate and sustained attention of all federal agencies regarding emergency and hazardous materials risk management. While it is

extremely important to note that what will follow in separate sections is of critical importance to every state in the western half of the United States, including the eastern sections of the western coastal states, it is of no less importance to areas such as Upstate New York, the Missouri Ozarks, or Appalachia, where the rural areas are far removed from the urban, metropolitan areas both in space and culture.

To continue either to ignore the categorical differences between frontier and urban, with rural leaning toward frontier, or to patronize the country folk is to court continued delusion. For federal agencies to say that the frontier either doesn't actually exist or that the frontier areas currently have LEPCs and hazardous materials response capabilities is paramount to agreeing with Hans Christian Anderson's courtiers in saying that the emperor has new clothes!

5. The Effects of Low Population on Rural and Frontier Response Organizations

The anthropological concept of the social cost of space has been addressed above. What needs to be addressed here is the specific effects of low population in extremely rural and rural areas on organizational systems, or as it were, the organizational costs of space.

A typical rural town has a mix of governmental and quasi-governmental groups, including those functional areas related to emergency and hazardous materials response: fire, law enforcement, emergency medical services, public works, public health, emergency management and elected public officials. It is critical to the understanding of hazardous materials risk management in rural and frontier areas that one understands the existing organizational mix at the local level. Let us look briefly at each of these areas in order to understand the functional underpinnings of our local rural and extremely rural management teams.⁹

Fire: VFD, or Volunteer Fire Department, is the typical fire organization. There might be other types of districts, other names, other acronyms, but what exists, basically, is a group of individuals who volunteer their time to prevent fires from turning into conflagrations which wipe out areas instead of buildings. They train, when they train, on their own time, they fight fires on their own time and they raise the money, on their own time, to do it too! Occasionally there may be a paid Chief, sometimes there are a few paid fire fighters along with lots of volunteers, but the heart of rural and frontier firefighting efforts is the volunteer sector, and it is structural.

In tandem with the volunteer structural department there may be a wildland/forestry fire crew and often a county road crew, that fights wildland fires. These crews typically will squirt water on a building, but will not or is not allowed to enter structures. Occasionally, depending upon the geographic location, there may be a nearby military fire fighting contingent or an industrial fire brigade that can lend a hand, but with few bases or industries, these are rare.

This is the frontier fire fighting reality, a bunch of folks in bunker gear, often hand-me-downs from regional paid departments, who are paged, leave their place

of employment, drive to the fire house, take the truck with equipment to the scene, and fight what's left of the fire. One Montana VFD has the motto "Same Day Service." That about sums it up.

Law Enforcement: Typically, organization consists of very small police departments with small jurisdictional areas, typically within the city limits. These departments work in conjunction with sheriff's offices with the problem of under ten sworn officers and large jurisdictions. Within the large geographic area of frontier counties, the officer-per-square-mile is minuscule. Given the fact the average population is less than six persons per square mile, many western areas must count on cross deputizing and mutual aid with local game wardens, highway patrol officers and tribal police to supplement local jurisdiction law enforcement officers.

Emergency Medical Services: There is a wide variety of EMS providers in extremely rural areas (volunteer, clinic, private, fire, etc.), but they all suffer from the same problems: lack of money, lack of technicians, lack of equipment and lack of volunteers. Some "hospital runs" can cost a volunteer a whole day's work. Tourists can overload systems set up for locals, drying up the volunteer base. Higher and more complex competencies make training requirements unmanageable on a volunteer basis.

Public Health: While EPA office personnel may be very familiar with acronyms like RCRA, EPCRA, CERCLA, CAA, CWA, OPA and even OSHA, it is more likely that a rural or frontier county sanitarian or code enforcement officer will be familiar with spending the day inspecting septic tanks and restaurants rather than going through hazardous materials or hazardous waste regulations. Some rural and frontier counties do not have permanent sanitarians. Many counties share sanitarians, some hire them on an as-needed basis. With their overwhelming work load and local customer focus, they have little time for, what from their perspective would seem to be, intrusive and unfunded federal mandates.

Public Works: Public works personnel should be welcomed players at emergency incidents. They are used to working outside, on streets, roads and highways. They have emergency equipment, barricades, etc. They have big trucks! Unfortunately, while a county or state may have a great deal of equipment and operators, it is spread out. The result is that very little equipment and personnel are available locally in a small town. And as for training, they have way too much real work to waste time on training.

Emergency Management: Emergency management is a low priority in rural and frontier city or county government. The majority of local emergency managers are part time. Most have many other duties, with other duties being known to include safety officer, coroner, junk vehicle officer and floodplain manager. The number of management courses needed to make a good emergency manager from scratch would use up all of a part timer's hours for two years. Yet, the position is critical

to emergency management and hazardous materials risk management activities in rural areas.¹⁰ It might even be said that without an effective local emergency manager, the odds are extremely low for having a good hazardous materials or emergency management program.

Elected Public Officials: County commissioners, mayors and even sheriffs are high among the leadership of local communities. Yet, they usually are not management types, being ranchers, farmers, businessmen, miners, loggers. They are workers, not managers. They have the final say so regarding many activities of governmental and quasi-governmental activities, yet they may have little to prepare them for their regular governmental duties, and probably lack the qualifications necessary to delve into disasters and hazardous materials emergencies.

6. Federal Theory Meets Rural and Frontier Facts

Federal theory, as evidenced in EPCRA and other SERC-LEPC initiatives, presumes the existence of local emergency planning committees (LEPCs). This theory presupposes the existence of an industrial tax base, paid responders, training on company time, adequate equipment and a variety of other luxuries.

Frontier facts are simple. There are probably no or few paid responders, outdated or non-existent equipment, no tax base, no time to train and no active local emergency planning committee. The amount of time, effort, and money requisite to produce a trained, equipped, planned and exercised response community is beyond the scope of most rural and frontier communities.

7. Toward Realistic Approaches to Rural and Frontier Hazardous Materials Risk Management

The EPA has funded at least one project designed to address the problems of frontier LEPCs¹¹, yet it has not addressed the fact that most frontier LEPCs exist only on paper, if even there. The EPA has had some success in creating coordinated hazardous materials response and risk management where none existed, yet this success is geographically intermittent. Much has been done, but the vast majority of the work lies ahead. The chances of a truck carrying hazardous materials having an accidental release within the jurisdiction of an active LEPC or within the jurisdiction of a local hazmat team are extremely poor.

Some frontier and rural states have programs and projects designed to develop active frontier LEPCs, but these programs tax the perseverance and creative skills of their staff, which is usually one lone arranger of things hazardous. The work that needs to be done, needs to be done effectively, efficiently and with a minimum of wasted effort and duplicated efforts.

Some approaches work better than others, some approaches have proven successes, some

approaches are worth using while others can kill an embryonic LEPC, causing stillbirth. And these realistic approaches, based on the previously-expounded realities of rural America, are the heart of this document and foundation of success of any rural hazmat program.

8. Some Realistic Approaches to Hazardous Materials Risk Management in Rural and Extremely Rural Areas

A. Start with Baseline Chemicals, Hometown Chemicals

FEMA had its nuclear attack, EPA had its worst case, and main street America could have cared less. They will not give up an evening, a weekend or a minute to hear about make-believe scenarios or federal mandates. Success, to date, in small towns with volunteers has been by the use of next-door chemicals. Failure has been catastrophic when the emphasis has been on catastrophic events and trainloads of extremely hazardous substances. The fight can't be won with theory, it can be won with facts.

Using a flip chart², a skilled facilitator can draw out of the local group the list of chemicals in their town that can hurt them, their kids, their parents, their friends. It does not matter what the list ends up being, because it will be real and it will be a starting place they can relate to and live with, since they do everyday! The baseline chemical list will look something like this:

- gasoline
- diesel
- LPG/propane
- acids/bases
- natural gas
- chlorine
- pesticides/poisons
- explosives
- crude oil
- anhydrous ammonia
- paints/solvents
- household chemicals

This list should be, will be, real to local fire fighters, local responders, local industrial folks. These are everyday chemicals in everyday towns. Luckily for trainers and planners, unluckily for citizens and responders, these pretty well cover the gamut of hazard classes, at least well enough to develop a baseline set of hazards. It is good to point out at this point that we are a chemical-based society, that chemicals are the reason our society is as it is. That is not to say it is good or bad, right or wrong, but that is just how it is. Chemicals are on the roads and rails, because they are destined for facilities in our towns that need them. These are the transportation industries and fixed facilities that hire our friends and

neighbors, that support our communities, that make America work. The chemicals are the chemicals of modern life, even in frontier America. Let's look at them:

Gasoline: It's everywhere; flammable liquid; fairly low flash point; kills a lot of people; causes a lot of property damage; comes in large quantities; has recognizable industry names; corner filling stations. Frequent large releases, often to do with highway traffic accidents, or smaller releases due to overfills at delivery sites.

Diesel: It's everywhere; fairly high flash point; large number of small releases due to saddle tanks on trucks involved in traffic accidents.

LPG/Propane: It's the heating fuel of choice in rural, camping and barbequing America; comes in varying sized containers; distribution sites in or near all small towns; infamous from Kingman, Arizona; associated with BLEVEs; a lot of it on the road; a liquefied-gas, looking for space, air.

Acids/Bases: Lots of acids used in refining and manufacturing; corrosives; eat their way to a more neutral pH; comes in large and small quantities; lot of it on the Interstates.

Natural Gas: Rarely on lists; explodes, burns, asphyxiates; infrastructure often old; releases often caused by backhoes; gathering lines and pipeline facilities.

Chlorine: A killer; basic manufacturing chemical; basic water purification chemical; large and small cylinders; lots of rail cars; municipal swimming pools.

Pesticides/Poisons: Including herbicides, fungicides, etc.; on seed wheat and potatoes, etc.; lots of it on roads at certain times of year; designed to kill; store in co-ops in or near all small towns.

Explosives: Unexploded military ordnance; old nitroglycerine and dynamite; high school chemistry labs; terrorist activities.

Crude Oil: Large quantities; production-area specific; environmentally nasty; very high flash point.

Anhydrous Ammonia: No water content, therefore hydrotropic (water-seeking); corrosive; inhalation hazard; distribution sites in or near all small towns; nurse tanks pulled by pickups.

Paints/Solvents: Everywhere; hardware stores and car parts stores; dry cleaning and automotive; many carcinogenic; flammable liquids.

Household Chemicals: Cleaning products; drain cleaners; charcoal starter; paint thinner; old stuff nobody knows what it is any more, and so on.

It should always be remembered that there rarely are either historical or zoned areas for chemicals in small towns. Hazardous materials distribution points are often in close proximity to residential areas, schools, retirement homes and medical facilities, often downwind in the pathway of prevailing winds. Once the frontier community firmly believes that there are hazardous materials next door, next door to their kids and spouses and parents and friends, then they can be moved to the next step, human pathways for chemicals, good and bad.

Pathway examination is critical to elevating the consciousness of small communities about hazardous materials. It humanizes and personalizes what is otherwise a technical nightmare. Humans intake air or food or liquids in four ways, and they intake hazardous materials in these same four ways, hazardous materials that can maim or kill them. If the emphasis is placed on the humans, the citizens, the responders, the industry employees, there is a much better chance at success, a much higher acceptance ration, than if the left-brain, technical side is overemphasized. [Technically-oriented trainers tend to over-chemicalize hazardous materials incidents, thus the following pathways section may be given first to humanize hazardous materials incidents.]

B. Entrance to the Human Body: Four Pathways

It is critical to emphasize in every way that they, the responders, citizens, industry employees, are the most important thing: not chemicals, not management systems, not governments, structures or highways. Emphasize that the way their body takes in food, water, oxygen, etc. is going to be the exact same way it takes in carbon monoxide, poison, etc. Prove to them that they have to understand themselves in order to stay safe. Discuss the four pathways, parallel them to environmental area for further emphasis. Show the environmental as a secondary safety problem, long term safety problem, yet a safety problem indeed.. Safety first, and it's their safety!

1. Inhalation: Breathing, in and out. Have them actually do it forcefully. Explain to them that this is a pathway and that does not differentiate the kind of hazard in that pathway. It could be a corrosive, a poison, an asphyxiant. The results would be different, all bad. Remind them that their body will breath, in and out, automatically. They can't stop the pathway. Environmentally, contrast clean air with air pollution.
2. Absorption: Something on the skin, slowly moving through the skin, past the muscles and into the blood stream. Again, it could be different

hazards using the same pathway. Environmentally, this can be compared with percolation through the soil into the aquifer.

3. Ingestion: Eating or drinking is the usual idea. But people don't usually eat or drink hazardous materials straight, but they could be swallowing contaminated saliva. Children could be playing on contaminated dirt. All swallowed material goes into the digestive tract. Environmentally similar to dumping something directly into the stream or river.

4. Injection: Needle injection often comes up, but at incidents it is usually either done via new or old cuts, abrasions, punctures, etc. This speeds up, through a more direct pathway, the entrance into the blood stream. Environmentally similar to a release near a wellhead that siphons material directly into the aquifer.

This creates a good teaching paradigm necessary for good training: Participants identify both with their own personal human body functions and with the chemicals which exist next door to them, their loved ones and their friends.

C. Personal Protective Equipment (PPE) in Frontier Areas

A person's past history, experiences, and training are far more important in changing behavior at hazardous materials incidents than is new data. Therefore, a trainer or facilitator, in order to be effective and change behavior, must address the standard incident comfort level of the responders, especially in rural and frontier areas. The local responders are not professional data managers used to manipulating abstract concepts. Deal with them where they are. Ask them for examples of personal protective equipment (PPE) they have and what it protects them against. A list might contain some or all of the following. Law enforcement: vests/bullets; latex gloves/blood borne pathogens. Fire: Bunker gear/some heat and flames; SCBA/airborne hazards. EMS: latex gloves/blood borne pathogens; goggles/blood borne pathogens, projectiles. Public works: leather gloves/scrapes, cuts. Public health: latex gloves. Emergency managers: Hard hats/things that hurt their heads.

Once they are comfortable explaining their PPE (they may have never used this phrase or acronym before), ask them to review the baseline chemicals and the four pathways. Then lead a discussion of PPE for hazardous materials incidents. Let the group come to the conclusion that they virtually have no protection against chemicals, except the firefighters and their SCBA in relation to inhalation hazards. What about simultaneous inhalation and absorption hazards or corrosives? Is the bunker gear really helpful at a hazardous materials incident? Are there false senses of security and protection?

Provide them with an understanding of the four levels, A-B-C-D of PPE

according to EPA and OSHA. Have them discuss where they personally fit on the A-D scale, which for the most part is the "street clothes" level. Then gently advise them that their PPE is distance, pure and simple. Distance moves their own, individual four pathways away from the chemical processes involved in the incident. They can understand this. They may want to do something. They may want "hands on." But what they need is to be safe.

D. North American Emergency Response Guide (NAERG) in Frontier Areas

With regards to safety, the most important document in hazardous materials response in rural and frontier jurisdictions is the NAERG. It is an accepted national standard of care. It is that standard against which incident response will most likely be measured by post-incident authorities. It is universally available, it can be adopted and should be adopted as the transportation incident response plan by jurisdictions, volunteer and paid fire departments, law enforcement, EMS, public health, public works and emergency managers, in lieu of oral or non-existent plans. Yet, it is not often marketed well. However, if it is introduced to the response and planning community here, after the baseline chemicals, four pathways and PPE/distance, then it is accepted as a necessary and appropriate guide to initial response, hands down.

Why? Because the appropriate question, after distance is described as personal PPE in frontier areas, is "What Distance?" The answer for NAERG chemicals is in the Guides. Safe distance is the hook to get their interest, then one can do NAERG training. Once they understand how to determine the isolation radius, how far to get people out and how far to keep new people away, then they can proceed to other parts of the Guides: Potential Hazards, Protective Clothing, Fire, Spill or Leak, First Aid, etc. This is a user-friendly, fool-proof system. They can be shown the green pages with their isolation and protective action distances and water-reactive tables and the white pages with the data management ideas and narrative sections. But if they don't see how this is important to them personally, individually, then they will not use it. And the way to get them to use it is to get them to buy into personal safety first, then public safety!

E. Don't try to sell ICS (Incident Command System): Use tabletop exercises with realistic scenarios to develop locally-intelligible incident management from the chaotic ground up.

The resistance to management training in general, and ICS training in particular, in rural and frontier areas is legendary and well-founded. Many governmental, managerial and developmental ads have come and gone. Time-restricted local responders don't want another three-letter acronym to put in the trash with MOB, TQM and MBA. In rural areas, any medium-sized to large incident, especially highway incidents, demands the use of a management system. Let the incident scenario demand management help, it can do it by itself. Use the five basic operational response areas: fire, law enforcement, EMS, public health, public

works.

It has been found that in rural and frontier areas, everything is done with neighbors, mutual aid and outside help. There are just not enough locals to go around. The fire lead may be the local VFD, but there usually are two or three mutual aid VFDs involved, plus a county wildland fire crew and maybe one from state forestry. The law enforcement lead may be the county sheriff's office, but they need help from city police, state highway patrol, game wardens, and in the west, tribal police, FBI and ATF. Public works lead may be either county roads or state highways, but each needs the other and sometimes city street crews' help. One county public health nurse or sanitarian can't handle a big incident, so city or state folks are called in. In addition, local, county and state emergency managers, public officials and industry personnel may be needed.

Let this group of fifteen or twenty agencies, which are necessary to handle a not-uncommon incident, demand a management system and the responders will beg for help. When someone comes to help, don't let them bring tomes of professional looking ICS/NIIMS documents. All a frontier or rural responder or manager needs is the basic concepts: Span of control and a logical differentiation of roles. Roles: Incident Commander (or Unified/Joint Command); Commander support (Liaison, Safety, Public Information); Operational Support (Logistics, Planning, Finance) and Operations (Fire, Law enforcement, EMS, Public Works, Public Health, Other).

Demonstrate that the Incident Commander and the Operations Chief need to be managers, perhaps with an operational specialty, but the emphasis has to be on management skills and not specific operational expertise. Explain the need for perspective, reflection, data management, analysis of the situation. Differentiate decision making from implementation of the decision. Show the need to group functional response agencies (Fire, Law enforcement, EMS, Public Works, Public Health, Other) and that each group needs a control, a lead person.

Once they can see this, then they will become interested in training to ICS, the national standard for incident management. Until they see the need by walking through incident scenarios, however, ICS trainers are wasting time in frontier America.¹³

F. Marketing CHEMTREC, CHEM-TEL, MSDSs and Information Management in Frontier Areas

Once the participants realize the incident scenario might or will involve technical personnel beyond the local responders' defensive operations level, whether they are hazmat team members, emergency room nurses and doctors, or public health nurses or technicians, local responders will see the need for information above and beyond that which NAERG can provide. That is when the trainer or facilitator shows them in the NAERG how to access CHEMTREC and/or CHEM-TEL to

get the MSDSs and the manufacturer data needed to learn the chemical specifics often necessary for technical response. Do not get bogged down here in EPA or OSHA regulations, just use a real MSDS from one of the baseline chemicals, like anhydrous ammonia, chlorine or LPG. Keep up the momentum of the training, don't kill it with regulatory confusion.

This is also a good time, since the subject is data management, to discuss data collection and data management. Show them that all incidents require responders and participants to know certain information in order to handle situations properly: exact location, chemical name, container, amount originally in container, amount released, release rate, weather, temperature, wind, responsible party names and numbers, insurance company names and numbers, etc. The group of participants, from the participating agencies and all affected groups, should develop a jurisdictionally-correct checklist. The NAERG pages 2 and 3 is a good start, but the hazmat team or the clerk and recorder might want different or subsequent information. Put their needs into the system early on.

9. Ain't got no LEPC! Ain't got no Plan! Don't want no LEPC! Don't want no Plan! Getting Past Negativity in Frontier Areas

As a trainer from Idaho once said, what they say is "Ain't got no LEPC! Don't want no LEPC!" Starting from scratch is the hardest thing to do and nothing succeeds like success. These two truisms may seem contradictory, but they are reality on the frontier and in rural areas. The key to success is targeting. No one can bring all jurisdictions up to speed at the same time. That approach beckons disaster. Target efforts to one local jurisdiction, county or small town, where there is one person in some important role (fire, law enforcement, EMS, public health, public works) who can act as a local catalyst. This person should be willing to dedicate work over the next three to five years, because that is what it takes to develop a local emergency hazardous materials response system. Then commit yourself to make trips to that jurisdiction every month for the next year.

Start with two or three awareness courses (using the principles outlined above). Then do a series of successive tabletop exercises, the first one being an orientation, working through the need for a management system (as outlined above). At that first orientation meeting, use a simple oral or one-page hazard analysis system, where the locals decide what are most likely, most locally-interesting, most-locally important scenarios.¹⁴ Plan to do three or four tabletops, making them sequentially more complex. Never make them more deadly or more complex or more intense than needed to give the local responders practice (that's what exercises should be in rural areas, practices, not tests) doing what they are currently equipped and trained to do. Do not go overboard, don't kill everyone, don't plan to fail!

The evolution of frontier exercises has led to the development of a two-hour exercise where four-to-six different scenarios, using baseline chemicals and relevant local data, are given to local teams, consecutively, one every twenty minutes. For each incident, the local teams then must develop incident strategies as well as operational management

plans for the functional areas of fire, law enforcement, EMS, public health and public works, as well as plan to interface with the fixed facility or the transporter. This forces the team to think quickly, as a team, and shows them that things that used to take the hours in early exercises where the team was in formational stages, can now be done in a matter of minutes, with an increasing level of professionalism, confidence and competency. Use of this exercise is recommended before moving outside.

10. Moving the Whole Thing Outside: The Field Exercise

Do not have a field exercise until two successive tabletops, using different scenarios, have proven that the local incident management system works. In the rural and frontier areas of America, very few responders will be at the Operations Level II, perhaps half will be at Awareness Level I. Some will have no training whatsoever. Regardless, there will be a dilemma. The local field personnel will be wanting "hands on" because that's what they are trained to do. That is what they want to do and that is why they volunteered to do all that work in the first place. It is critical that everyone at all levels of government understand this. The responders, the real field people, want to go outside and play. On the other hand, the reality is that response should be according to EPA, OSHA and the NAERG. The Incident Commander, the Operations Chief and the Controls/Leads for fire, law enforcement, EMS, public works and public health should understand and should be implementing an NAERG-based response plan that is essentially "hands-off" and "minds-on!"

No one should be allowed to "play" until a management systems is in place that is based on training, equipment, exercising and planning which in turn are to be based on federal regulations and guidelines. No one should be allowed to go to the field, even to do defensive "hands-on," until the management (IC and Ops Chief, plus Operational Functional Controls/Leads) are sure that everyone in Operations, including all field personnel and mutual aid folks, realize that all "hands-on" must be in compliance with standards and with the "minds-on" management plan developed in the tabletop exercises. Everyone must realize that field exercises in frontier areas are almost universally defensive exercises. All necessary training should have been accomplished and exercised before a field exercise is undertaken, regardless how much chomping at the bit goes on.

11. Federal Agencies, Regulations and National Standards: Their Roles in Frontier Areas

So far the plan has been to sell safety, planning, exercises and hard work using the principles of commons sense, personal and familial safety and community service. It must be remembered that frontier folks are non-governmental types, volunteers, people who do other things for a living at the rate of 60-80 hours a week. The only way to get them "in compliance" is to work them into it slowly. Sow them the personal win-win, the community win-win, the volunteer-organization win-win, then build on that. It is best not to mention federal regulations early on, for maybe the first six meetings, or six months or a year. Build the trust, build the confidence, build the team, show them how they have been "in compliance" (explain it as "progressive activities toward compliance," which

will in fact be the case if one follows the course outlined above), and how they can now accelerate that process. Give them the necessary basics, at a level comparable to the frontier need!

A. OSHA

Start with OSHA 29 CFR 1910.120 and give them the actual five level training regulations. Show them how what they have been doing complies with the regulations. Of course, a trainer could introduce these concepts, briefly and simply, early on in the Awareness Level I training, but do not waste a community confidence-and-awareness-building opportunity, such as an Awareness course, by trying to explain federal regulations. They might throw the Awareness out with the bath water, as it were.

Explain OSHA as the employee safety and health people. Employees here being considered as paid or volunteer, thus incorporating volunteer fire fighters and volunteer ambulance personnel. This is also a good time to address the "hazard communication" concept, the MSDSs system and why and how that system works. It is very helpful later on for them to know this. It is not necessary for them to understand hazard communication in order to obtain an MSDS from CHEMTREC for an ER doctor during an incident. It is necessary for them to understand it to help develop and sell a comprehensive planning effort later on.

B. FEMA

FEMA is best marketed as the citizen's friend, the group that puts back up bridges, repairs roads, promotes and manages flood insurance programs. If OSHA looks after the responders, FEMA looks after the citizens. Emergency managers don't manage flood waters or forest fires or earthquakes, they manage the activities of people.

C. EPA

If the role of OSHA and FEMA are best explained by using the words themselves and not the acronym, then this holds true for EPA as well. The Environmental Protection Agency lets the responders and the citizens know that someone is watching out for the air, soil and water which form the environment in which they exist. Someone is keeping tabs on the hazards at the secondary, environmental level and that somebody is the EPA. Sometimes the EPA acts as OSHA, sometimes it acts in concert with FEMA, but it is basically a regulatory agency designed to keep the environment and its inhabitants healthy.

D. DOT

The U.S. Department of Transportation has a role to play in hazardous materials because the business of America runs on chemicals, manufactured in one place

and used in another. The regulations and guidelines are voluminous and well intentioned. What rural and extremely rural responders need to know is for all intents and purposes contained in the NAERG, which in the U.S. is sponsored by DOT.

E. National Fire Protection Association (NFPA)

Firefighters have a group, the NFPA, which develops national standards for various things, including competencies regarding hazardous materials response. While they are not federal regulations, they are national standards, against which response and response planning can be measured, both before the fact and after an incident, by lawyers, judges, juries and regulators. Firefighters should be familiar with NFPA.

F. Emergency Planning and Community Right-to-Know Act (EPCRA) or SARA Title III

EPCRA or SARA Title III brings together many of the hazardous materials initiatives of OSHA, FEMA, EPA and DOT under one roof and provides for the development of an infrastructure for coordinated hazardous materials risk management. That infrastructure is the local emergency planning committee (LEPC) and state emergency response commission (SERC) system. If there has been a coordinated series of viable local exercises and locals understand the NAERG and MSDSs, as well as standard defensive fire fighting and EMS procedures at hazardous materials incidents, and use a basic form of ICS, then SARA Title III's planning and exercising requirements should make complete sense. But do not try to sell SARA Title III first. Sell safety first and the regulation second or third or fourth, it will have far better results.

G. CERCLA, RCRA, CWA, CAA and so on

Let the specialist in these fields, if there are any locally, deal with the niceties of these laws, do not inflict them upon ranchers, farmers, loggers, miners, small business women and men acting as volunteer ambulance drivers and volunteer fire fighters. If there are no local specialists, negotiate with state personnel to supply needed expertise for these areas during complex incidents.

12. Planning Efforts in Frontier Areas

Plans must be the written version of actual field activities. Until sufficient scenarios have been developed and until sufficient emergency operations procedures have been developed for these incidents and "exercised," then intense planning efforts will produce documents, but not realistic plans. However, once the NAERG has been adopted locally, once the management team concept has been accepted and practiced, once the functional areas under Operations have standard operating procedures for the cooperating agencies, once the response community acts like a team, once industry is taken in as a partner and

is not perceived as the enemy, then planning efforts are productive. They help take the team to a higher level, a consistently proactive level, a planning team level. Soon various functional components of the bigger team begin to have their own team spirit. Soon smaller sub-groups, for instance industry and fire, vie to see who can have the most efficient and effective internal operating procedures. Soon the plan is a live organism and not a deadly shelf document.

History has shown several things regarding this approach. One: Awareness courses and sequentially harder tabletops are the best builder of community support for hazardous materials and emergency management planning activities. Two: Once the home fire is started, training, planning and exercising become self-generating and the facilitator can move on to another jurisdiction.

One of the key planning issues facing rural communities, especially those that have developed successful Operations Level II defensive response capabilities, is addressing with the local elected officials their responsibility for providing for Level III and Level IV, hazardous materials technician and specialist support. This aggressive, offensive support is required when the incident needs outstrip the local capabilities. During an incident is no time to address "What do we do when we can do no more?"

Whether the actual answer lies with contracted services of providers on retainer or under contract, or with state or federal or industrial responders, the answer should be in writing. It should be kept current and it should be easily and quickly initiated by the incident commander, without unnecessary delay or need for executive approval. Lack of response capabilities does not eliminate public safety or planning responsibilities on the part of a jurisdiction. This is abundantly clear to regulators, judges and plaintiffs' lawyers.

It is of great concern to rural and frontier hazardous materials risk management personnel that wholesale distribution facilities for anhydrous ammonia and propane, tank farms for flammable liquids, and co-ops with large quantities of pesticides and farm chemicals in or in close proximity to small towns with little or no response capabilities. It must be remembered, that the ability to contract for hazmat response services from a distant urbanized area, with perhaps six or ten hours elapsing before the arrival of the first response truck, does not alleviate the problems caused either by transportation or fixed facility releases in small towns.

13. Training Efforts and Additional Equipment in Frontier Areas

Simultaneous with a higher level of planning efforts comes increased training efforts. The different scenarios have shown responders their weaknesses, their voids, their shortcomings. They see the real personal and professional need for further training. They begin to ask for more training, a higher level of training, more intense training. People want to become functional team leaders, operational leaders, incident commanders. People want more specific training on baseline chemicals: acids, chlorine, anhydrous ammonia. People want new equipment and the training to use it.

Training monies are often the easiest for agencies to come by, through state or federal training grants. Equipment is harder to find, but industrial benefactors can be found and monies saved through training grants can be reallocated to equipment purchases. A process of continuous, incremental improvement leads to increased planning and training activities.

Hazardous materials response efforts in small towns, where no full team will ever be found due to tax base, population base and industrial base problems, have been known to spur on regional efforts. In certain rural areas, similar closely-located communities have attempted to pool personnel and equipment to field regional teams. These teams plan to train together and come together upon the arrival of the different members to the incident site from four or six surrounding communities.

It may take five years of hard work, but it will never happen if the process isn't started now. It will never happen if everyone, or sometimes anyone, says it can never happen. Yet, it can and has happened, but it takes a logical process, geared to rural and frontier cultural and jurisdictional realities.

One of the most logical and most productive ways to obtain training is to approach the local industry representative, such as an anhydrous distributor, a trainmaster or a tank farm operator, and request set-aside training for local responders or for spaces for local responders at local industry training classes. This not only builds teams and trust, it also facilitates response when incoming industry responders are familiar with local governmental or volunteer responders. It is also a great idea to contact state, regional or national CAER(r) and TRANSCAER(r) representatives, railroad training car representatives, petroleum industry representatives, the Chlorine Institute, the state Department of Agriculture or Environmental Quality, EPA, DOT, FEMA and other federal agencies or private organizations to learn about upcoming training opportunities, most of which are free or have but a nominal cost.

14. Building on the Baseline

Once the baseline chemicals are accepted as just that, the foundation of local hazardous materials risk management; when the local PPE supply has grown to a level to handle the hazards involved with baseline chemicals; after sufficient scenarios have been exercised to develop a local incident management system with team members familiar with each other and the ICS system; and at the time the local team is just that, a team, then the time has come to go past the baseline, to build on the foundation.

This can be done, well, very and logically. In the developmental exercise or practice situation with their local scenarios, the facilitator encourages and directs the players to design the scenarios which will allow them to safely and successfully practice their parts. Once the fire folks have handled chlorine, acids, anhydrous and flammable liquids successfully sufficient times; after EMS has triaged and transported a variety of standard cases; when law enforcement has proven its mettle with crowd control and traffic jams; sanitarians have managed disposal and road crews have diked and barricaded to their

hearts content, then it is time to crank up a notch the different factors involved in the scenarios in order to stress the seasoned responders (remember, that early on stress is not the key, practice is) and force them to a higher level. How is that done?

Logically and systematically! It must always be kept in mind that given the local tax base, population base, commerce base and industry base, there is an optimum level of response for that given community. Analysis of the local conditions can result in a fairly accurate determination of current and optimum response levels.¹⁵ Keep in mind, one does not want to intentionally design a scenario to over stress the local capabilities without simultaneously accounting for mutual aid, state, federal or industrial resources to meet the local need.

Given the above, cranking up the scenario is simple. For law enforcement, it is possible to make the incident a crime scene, using either an environmental crime, a terrorist crime or a dumb crime. For fire, the chemicals can be made more toxic, more flammable, more corrosive. For fire and EMS the injuries can be more life-threatening, the extrication more complex, the interface with the chemicals more intense. For public health, spread some steaks around from a frozen food truck, drop some pesticides into surface water, cause a more serious aquifer-related problem. For public works, have a need for damming and diking, dust remediation, or extensive barricading. Have some cows and horses affected, fishing or hunting seasons impacted or tourist traffic, if you want to see some real action. But never, never, do any of this without both the input from and the concurrence of the affected functions and their associated agencies.

The principle of continual small improvements, which works so well in management activities, works well also in scenario design. Even changing the location of an incident, without actually changing the non-location facts of the scenario, changes jurisdictions, lead agencies and the ICS management folks involved in event. Just remember, this is a team-building exercise, a practice, a small piece in a long term process.¹⁶

15. The Future of Frontier LEPCs and Frontier HazMat.

We should be taking our lead from the people, from the responders in the rural and frontier areas, from those affected by our decisions. The lead should not be coming from the regulators or the legislators. The laws, especially SARA Title III, were designed for the populace and the local responders. The laws and the regulators that enforce them should not become the focus of attention. The goal should remain the same, support of local responders and citizens regarding hazardous materials risk management at the local level. Federal agencies should be looking to the towns, not to downtown. They should be using the knowledge and experience of the successful rural and frontier LEPCs to develop initiatives designed to create more successful ones.

It should be remembered that everything depends not upon regulation and enforcement, but upon finding one local person to take the lead and develop the local team over a period of three to five years. It should be acknowledged that few, less than half probably, of all extremely rural counties will ever achieve successful LEPCs. The goal should be an

extremely rural, frontier "standard of care," which accepts the U.S. DHHS and U.S. Congress reality-based concept of frontier status. And everyone should accept that someone has to act as the skilled facilitator of the local process.

How can the federal government facilitate this local process? Think outside of the lines! Perhaps OSHA could promote something resembling enhanced-operations Level II or focused-technician Level III which would easily allow for in-compliance rural responses to acid or chlorine or other baseline releases in extremely rural areas. Remember, the responses will always occur (without the non-existent frontier hazmat team) and they will most often occur out-of-technical-compliance if the standard, the compliance standard, is not flexed. DOT could allow for equipment purchases for basic, non-extravagant items under training grants. EPA, FEMA and DOT, under training grants, could allow for overtime or replacement-time payments for volunteers (who are losing wages) who are currently donating nights and weekends to all exercises or training. This would do nothing more than make them equal with paid responders. Or perhaps Congress could fund mobile in-state regional response teams for areas (and states) without sufficient tax, population or industry bases.

¹See: A.H. Anderson, "Space as a Social Cost," *Journal of Farm Economics*, Volume 32, No. 3, 1950; and Carl Kraenzel, "Sutland and Yonland Setting for Community Organization in the Great Plains," *Rural Sociology*, Vol. 18 (1953, pp. 344-58.

²U.S. Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, Bureau of Health Care and Deliver Assistance, "Primary Care Activities in Frontier Areas - Regional Program Guidance Memorandum 86-10," unpublished memorandum, Rockville, MD June 10, 1986; Laura Summer, "Limited Access: Health Care for the Rural Poor," Center on Budget and Policy Priorities, Washington, D.C., March, 1991; and Congress of the United States, Office of Technology Assessment, Rural Health Care, "Defining 'Rural' Areas: Impact on Health Care Policy and Research," July, 1989.

³Congress of the U.S., "Defining Rural Areas", p 1-3.

⁴Frederick J. Cowie, Ph.D., Montana Disaster and Emergency Services, "Beyond Rural: Emergency Management in Extremely Rural (Frontier) Areas," 1992.

⁵ See Attachment 1, dramatic map of Montana with the original thirteen colonies inlaid.

⁶DHHS, "Primary Care"

⁷See Attachment 2, map from DHHS, "Defining Rural Areas . . . " on frontier counties in the U.S.

⁸See Attachments 3 and 4, maps from DHHS, "Defining Rural Areas . . . "

on metropolitan and urban population sites, with the remainder being rural and frontier areas.

⁹For a more in depth discussion of these ideas, see Cowie, *Beyond Rural . . .*, and the items cited therein.

¹⁰See Frederick J. Cowie, Ph.D., *Hazardous Materials Risk Management in Extremely Rural Areas*, 1993.

¹¹Frederick J. Cowie, Ph.D., *Developing Realistic LEPCs in Extremely Rural (Frontier) Areas*, 1994.

¹²Use technology comparable with that available locally to your audience. Flip chart is comparable to the clip board you will find in small towns. No fancy computer programs, please!

¹³Frederick J. Cowie, Ph.D., *A Visioning Approach to Exercise Design in Extremely Rural (Frontier) Areas*, 1997.

¹⁴See hazard analysis form in Fred Cowie, *Developing Realistic LEPCs . . .*

¹⁵See Cowie, "Beyond Rural" concerning response level determination.

¹⁶See Cowie, "Visioning" for fundamental basics of this process. *Realistic Approaches to Rural and Frontier Hazardous Materials Risk Management* by Frederick J. (Fred) Cowie, Ph.D., Montana; with Monty Elder, Oklahoma; and Rayna Leibowitz, Maine.